No. 4
Jan. 31, 1956

T R O P I C A L H O U S I N G & P L A N N I N G

M O N T H L Y B U L L E T I N

for Dr. C. A. DOXIADES*

I. Current Literature

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Housing for Africans
in Southern Rhodesia

Further information on any of the digests may be obtained on request by reference to the Bulletin no. and the item no.--i.e., 2.3 would refer to New Zealand. Minister of Housing. Housing, 1955. Wellington, Government Printer, 1955. 38p., plans, tables, chart.

* This report has been compiled for private circulation only by Prof. J. Tyrwhitt, 77 Trowbridge Street, Cambridge, Mass., USA.

I. CURRENT LITERATURE

GENERAL

1. Japan. Bureau of Statistics. Report on the housing survey of 1953. Tokyo, The Bureau, Mar. 1954. 413p., maps, charts, tables. Available on request of the Bureau at Tokyo.

   Addendum to digest of Dec. 31, 1955, no. 3, p. 1, giving some cost figures.

TABLE 23. (Sampling) - NUMBER OF DWELLING HOUSES BY CLASS OF MONTHLY RENT AND NUMBER OF TATAMI FOR SHI AREA OF ALL JAPAN (RENTED HOUSES)

1. Excluding dwelling houses occupied by temporary residents, vacant, under construction, temporary huts, dormitories, boarding houses and non-dwelling houses and quasi-household of 2 or more persons.
2. Figures may not add to totals due to rounding.

Monthly rent	Total No	Area Less than 6 tatami	6 8	9 11	12 14	15 17	18 20	21 23	24 29	(Houses) 30 35	36 tatami and more
Total	2 290 000	171 000	411 000	544 000	435 000	254 000	186 000	106 000	115 000	39 000	27 000
Yen	125 000	12 000	31 000	22 000	20 000	12 000	9 000	5 300	6 300	3 600	3 600
1 - 299	221 000	25 000	69 000	68 000	34 000	13 000	6 500	2 400	1 500	800	300
300 599	490 000	35 000	126 000	163 000	87 000	38 000	21 000	7 500	8 100	2 100	1 900
600 899	452 000	25 000	68 000	137 000	112 000	52 000	29 000	13 000	12 000	2 500	1 600
900 1 199	349 000	19 000	40 000	68 000	79 000	56 000	40 000	21 000	18 000	4 300	2 300
1 200 1 499	155 000	5 800	12 000	21 000	32 000	26 000	24 000	15 000	14 000	3 100	1 300
1 500 1 799	169 000	12 000	17 000	21 000	27 000	24 000	24 000	17 000	18 000	5 300	2 800
1 800 2 099	124 000	14 000	16 000	15 000	17 000	14 000	13 000	12 000	15 000	5 300	2 600
2 100 2 399	22 000	1 500	1 600	2 600	2 300	2 300	1 900	2 700	4 500	1 800	700
2 400 2 699	47 000	6 900	8 000	5 000	5 200	4 300	5 000	2 900	5 300	2 300	1 600
2 700 2 999	10 000	800	800	1 000	1 900	700	1 100	900	1 100	1 100	600
3 000 3 499	48 000	7 300	8 500	6 200	5 900	4 600	3 200	2 300	4 800	2 600	2 100
3 500 3 999	15 000	1 800	3 100	2 600	1 600	900	1 100	900	1 200	900	1 200
4 000 4 499	12 000	1 400	2 100	1 600	1 900	900	800	500	1 300	800	700
4 500 4 999	4 500	400	900	600	400	500	500	200	300	300	200
5 000 Yen and more	30 000	3 000	4 200	3 900	3 900	3 100	2 900	1 800	2 800	1 900	2 600
Not reported	18 000	1 500	3 300	4 100	3 200	1 600	1 400	1 100	700	300	700

Note: Each Tatami or mat, measures approximately 6'0" x 3'0" or just under 2m x 1m.

2. Pan American Union. Inter-American Economic and Social Council. Problems of housing of social interest. Report prepared by the Ad Hoc Committee for the Study of the Low-cost Housing Problem. Revised ed. Washington, Pan American Union, 1954. 232p.

Contents: Statements of delegates of the American Republics in the Tenth Inter-American Conference; also changes proposed by Resolution XXXIV and text of Resolutions related to housing approved by the Conference.

In general the statements are too generalized to be pertinent here. Report is largely concerned with economic background of people. The following, however, may be of interest:

a. Metropolitan Housing:

Total annual cost of building (on the basis of construction costs amounting to $24.60 per square meter plus 25% for improvements, making a total of $30.75, or $1,845 per unit) 363,363 new units to take care of the present shortage, replacements because of deterioration, and the housing of the annual increase in population	$ 670,404,735
Annual cost of repairs based on the present degree of deterioration ($19,010,800 for 47,527 housing units requiring major repairs, estimated at $400 per unit; $6,337,200 for 31,686 dwelling units requiring minor repairs, estimated at a cost of $200 per unit)	$ 25,348,000

b. Urban Housing:

Annual cost of building (on the basis of construction costs of $23.50 per square meter, added to the cost of improvements amounting to $29.40, or a total of $1,764 per dwelling unit) for 244,172 new units to take care of the present shortage, replacement because of deterioration, and the housing of the annual increase in population	$ 430,719,408
Annual cost of repairs (based on $250 per unit) for 107,216 units	$ 26,804,000

c. Rural Housing:

Annual cost of building (on the basis of $400 per dwelling, using local materials and human resources at practically no cost, based on the application of self-help and mutual-aid systems, for 632,806 units)	$ 253,122,400

What the people have to pay for housing, of course, depends on their incomes. In Latin America generally the income is as follows:

INCOME

TABLE V

Country	Year	a National Income (in millions of dollars)	b Annual Per Capita Income (in dollars)	c Annual Per Family Income (in dollars)
Argentina	51	5,087	291.10	1,251.73
Bolivia	50	312.6	103.50	558.90
Brazil	51	11,735	219.85	1,134.42
Chile	50	1,390.6	239.79	1,318.84
Colombia	50	2,841	252.16	1,437.31
Costa Rica	49	145	181.25	1,013.18
Cuba	51	1,833	338.82	1,524.69
Dominican Republic	51	372	117.66	623.59
Ecuador	49	176.6	55.15	308.84
El Salvador		195.8	102.00	513.06
Guatemala	51	522.3	146.27	775.23
Haiti		173.7	55.0 a/	291.50
Honduras	51	178	115.21	791.49
Mexico	50	4,371.7	170.00	816.00
Nicaragua	50	137	130.10	702.00
Panama		204.2	250.00 a/	1,062.50
Paraguay	50	163.4	114.87	643.27
Peru	51	967	112.99	610.14
Puerto Rico (U.S.A.)	51	836	374.00	1,909.00
Uruguay		555.5	224.00	940.80
Venezuela	51	2,147.7	423.52	2,541.12
Latin America b/		33,409.1	211.45	1,067.82

a/ estimate b/ not including Puerto Rico

And the following table shows the breakdown of this income (including the percentage for housing) in 11 of these countries.

Cost of Living Index Numbers for the Working Class in Certain Countries by Category of Consumption

TABLE VI

Country	Total	Food	Clothing	Other	Housing	Light and Heat	Housing and Services
Brazil	100	54.12	10.56	15.58	15.33	4.41	19.74
Chile	100	45.00	15.00	12.50	20.00	7.50	27.50
Colombia	100	65.70	5.40	6.90	16.20	5.80	22.00
Costa Rica	100	49.63	10.69	6.05	25.38	8.25	33.63
Dominican Rep.	100	39.02	16.19	15.98	26.44b/	2.37	28.81
Guatemala	100	57.30	9.10	12.20	15.20	6.20	21.40
Mexico	100	76.02	11.38	12.60 a/	-	-	12.60
Peru	100	55.00	12.00	15.00	18.00	-	18.00
Puerto Rice (USA)	100	51.90	9.50	29.90	5.70	3.00	8.70
United States	100	33.90	10.50	31.10	18.10	6.40	24.50
Uruguay	100	59.68	6.10	22.22	12.00	-	12.00

a/ Includes household expenses
b/ Includes rent, water and electricity

Source: UN Economic and Social Council, "National Practices in the Field of Retail Prices and Retail Price Index Numbers," January 1953.

I. CURRENT LITERATURE

HOT DRY AREAS

3. António de Aguiar, Joao. L'habitation dans les pays tropicaux. I, Organisation des communautés; II, Disposition des logements; III, Considérations d'hygiène dans les logements. Lisbon, Federation Internationale de l'Habitation et de l'Urbanisme, 1952. various paging, photos., plans, sketches, tables. (XXI Congrès, Lisbonne, 1952.)

Limpopo
Climate: circa 112°F-46°F
Rainfall: 31"

Senor António de Aguiar is "architecte sous-directeur du Cabinet d'Urbanisation des Provinces d'Outre-mer," [Portugal], and his illustrations are of the work of various organizations in the Portuguese territories of Angola, Mozambique, Guinea and St. Thomas. There are copious illustrations of this housing. Many of them show use of thatch as roofing, and frequent use is made of arcades and colonnades as a protection from the sun. Most of the housing is of the very small single-dwelling type and of concrete construction. There follow examples of housing for government workers and officials of the various industries.

A summing up of construction is made as follows:

TOITURES:

1.° --tuiles, fibro-ciment ou plaques d'aluminium aved:

a)--caisse d'air séparée des pièces par la structure des plafonds;

b)--orifices de ventilation disposés près de la bordure et du faîte des toits;

c)--emploi de matériaux isolants sur les plafonds pour éviter l'irridation.

2.° --chaume--l'application doit en être permise pour des raisons économiques ou esthétiques. La durée d'une telle toiture ne pourra depasser un an.

3.° --terrasse--isolement thermique obligatoire avec des matériaux isolants, de facon à éviter l'irridiation.

MURS EXTÉRIEURS:

1.° --Orientation Nord et Sud. Pour des raisons d'ordre économique, on peut éviter la protection.

2.° --Orientation Est. On peut négliger la protection dans le case des chambres à coucher.

3.°--Orientation Ouest. Protection obligatoire qui ne pourra etre negligée que dans le case de pièces de courte permanence (dépense, débarras, salle de bain).

Quand il n'y aura pas d'ouvertures dans les murs extérieurs exposés à l'Est et à l'Ouest et que ces murs seront en contact avec des pièces de longue permanence, on devra en exiger la défense contre l'irridiation au moyen de matériaux isolants.

PORTES ET FENETRES:

1.°--Système de chassis fermant hermétiquement l'ouverture.

2.°--Protection avec volets, stores ou jalousies.

AERATION:

1. --Installation de bouches d'aération près du plafond et du plancher, disposées en enfilade à travers toute le construction et atteignant toutes les pièces.

On considère comme ventilateurs les impostes mobiles et les vasistas, quand ils sont près du plafond, et l'interstice entre la porte et le plancher quand les ouvertures sont disposées suivant les conditions établies au n° 1.

CUISINE:

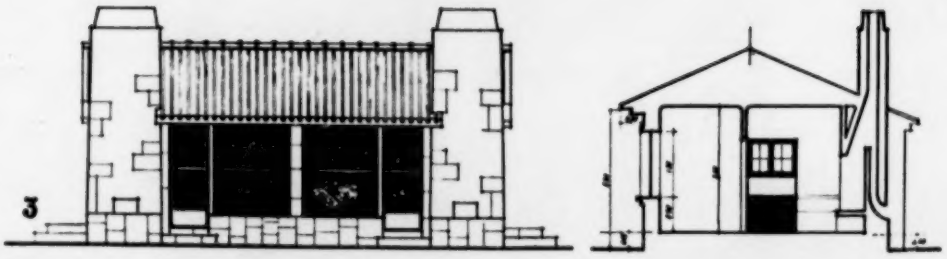
Lorsqu'elle est intégrée dans l'habitation, on isolera les cloisons interieures avec des matériaux appropriés, à moins qu'elle ne soit contiguë a des dépendances de courte permanence.

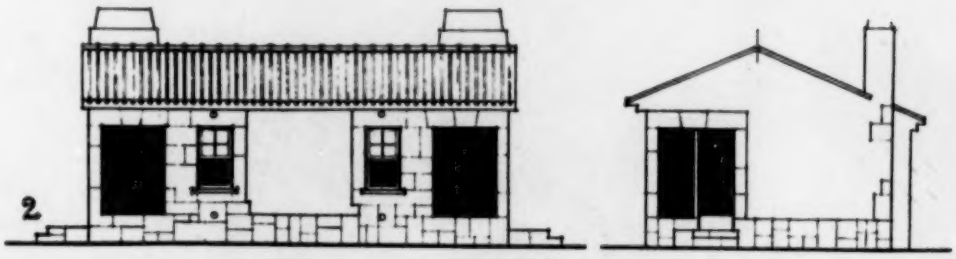
The following is a break-down of costs of 2 types of this housing:

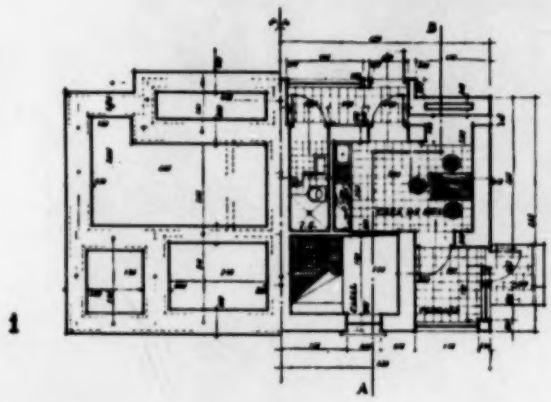
TABLEAU No 1

	TYPE I 2 Habitants				TYPE II 4 Habitants			
	Superficies		Volume par habitant	Cout de la construction	Superficies		Volume par habitant	Cout de la construction
	Par piece	Par habitant			Par piece	par habitant		
Chambre de conjoints.	4m2,75	-	7m3,13	-	4m2,75	-	7m3,13	-
Chambre de garcons.	-	-	-	-	4m2,75	-	7m3,13	-
Chambre de Filles.	-	-	-	-	-	-	-	-
Salle commune	7m2,75	-	-	-	9m2,10	-	-	-
W.C. et salle de bain	2m2,34	-	-	-	2m2,48	-	-	-
Terrasse	2m2,64	-	-	-	3m2,63	-	-	-
Galerie	2m2,71	-	-	-	1m2,60	-	-	-
Superficie de construction	27m2,98	14m2,49	-	28.545 *	37m2,96	9m2,49	-	25.643
Cout par habitant	-	-	-	14.272	-	-	-	8.910

* 1.000 esendros = $10.00







1 — Plans des fondations et

2 — Façades principale et laterale.

3 — Façade postérieure et coupe.

4. Iraq pushes extensive program for housing. (In Foreign commerce weekly, published by the U.S. Dept. of Commerce, Oct. 31, 1955, vol. 54:18, p. 2.)

Under Iraq's new 5-year Development Board program it is planned to spend the equivalent of $26,460,000 for housing. This sum is budgeted as follows: $16.8 million for general housing and slum clearance; $4.2 million for workers' housing, $3.5 million for Government employees' housing, and $1.96 million for housing for specific industrial projects. Additional sums may be allocated later, and in addition to this Development Board project other governmental plans for housing are going forward.

The Government recognizes the need for middle- and low-income housing and the program initiated is beyond capability of the Government and the Iraqi contractors to carry out fast enough with available staff, equipment and technical knowledge. It is expected that foreign construction firms will have to assist.

There follow two paragraphs concerning the Development Board's contract with C.A. Doxiadis and Associates and the program initiated by them.

Until the Development Board's program was established the Ministry of Social Affairs was the principal agency of Government concerned with housing, but it now takes a minor role. However, this Ministry is planning a $1.4 million housing program for industrial workers in Baghdad. This is over and above the Development Board's program, but it is possible that in the fiscal year 1956-57 it will be incorporated with the Development Board program.

The Ministry has been consulting British construction firms and has indicated a willingness to do the same with any interested U.S. firms. They have arranged with the British firm, George Wimpey & Co. to construct five model houses and if satisfactory 500 of these will be contracted for.

A third organization, the Ministry of Defense, has been allocated $2.8 million for housing, barracks and other building, and an additional $14 million has been allocated by the Development Board of this same Ministry of Defense for the same period.

No details are available but it is said that various foreign firms are discussing contract terms.

The above note is from the Embassy, Baghdad.

5. Little, Arthur D., Inc. Demonstration of stabilized mud brick in Egyptian village housing. Final report on contract number SCC-14032, to [U.S.] Technical cooperation Administration, Department of State. Cambridge, Mass., Arthur D. Little, Inc., Sept. 15, 1953. 52p. processed, photos., plans, elevations, cross sections.

Moderate rainfall: Alexandria and coastal section north of Tanta.

Low rainfall: Tanta to Cairo and Middle Egypt.

Dry climate: Upper Egypt.

This is a detailed record of the work performed under the auspices of the Technical Cooperation Administration, Point IV Program of the U.S. Dept. of State, in collaboration with the Government of the Republic of Egypt, to demonstrate that the stabilized mud brick recommended in their April 1952 report could be used sucessfully to construct village housing that would withstand deterioration by prolonged rainfall. Other objects of this study were to establish the cost of making stabilized mud brick on a large scale, and to determine accurately the cost of building an improved village dwelling.

The report is preponderantly concerned with the technical details of experiments in ways of manufacturing the brick, and these details have been summarized by the authors as follows:

SUMMARY

1. Forty thousand sun-dried Diatol-stabilized mud brick were made at Abu Rawash to determine costs and mixing capacity of the Winget mixer.

2. The cost of Diatol-stabilized brick made at Abu Rawash using contract labor was L.E. 2.16 per thousand. (LE 1.00 = $2.88)

3. A small structure about 5 meters square was constructed of stabilized mud brick on Mr. Sidnoui's Esba at Abu Rawash, about 25 kilometers north of Cairo on the Mansurieh Canal.

4. Burned red brick delivered to the site at Abu Rawash cost L.E. 3.84 was made by using stabilized mud brick.

5. An agreement was made with the Minister of Social Affairs to construct twenty houses for the purpose of demonstrating the use of stabilized mud brick and to determine accurately the building costs. This agreement was signed on February 5, 1953, by the country director of T.C.A. in Egypt and the Minister of Social Affairs for the Egyptian Government.

6. Plans for six dwellings to be constructed at Embaba, Surs El Layan, and Kafr El

Sheikh were submitted to the director of Popular Housing on February 9, 1953. These plans were later modified by the director and accepted by T.C.A. representatives on April 7, 1953.

7. After considerable delay, the contract to make stabilized mud brick at the building site at Embaba was awarded to a local brick-maker, at a contract price of L.E. 2.20 per thousand.

8. Brickmaking at Embaba was begun on May 26, 1953, but, on account of Ramadan and the Bairam holidays, the operations did not get into full swing until June 15th.

9. The required quantity of brick was completed about July 15, 1953.

10. No construction or laying of foundations for the proposed dwelling unit had taken place up to July 15, 1953.

11. It was established that a Jaeger mortar mixer, a Winget mortar mixer, or a Millar road mixer could be used satisfactorily to incorporate a stabilizer in sun-dried mud brick. The portable Winget mixer can mix enough stabilizer in prepared mud for 6,000 brick per day. The Millar portable EE mixer is capable of producing enough stabilized mud for 40,000 bricks per day, which is about 80% of the capacity of the largest brick yard in Cairo. The capacity of this machine makes it suitable for any large-scale village housing scheme.

12. An asphalt solution made by Shell Oil Co., Ltd., appears to be a satisfactory stabilizer for mud brick, and indications are that it may be cheaper and better than Diatol as a stabilizer. The asphalt solution is available in all the Middle Eastern countries and is made to specifications generally recognized throughout the world.

13. Satisfactory stabilized mud brick probably cannot be produced for much less than L.E. 2.00 per thousand.

The following facts too are of interest: a room of 3 sq. meters with a domed roof will require in round figures about 8000 bricks; a 3-room dwelling with courts, stables, beds, ovens, stairs, etc., will require some 30-40,000 bricks. A good, well-organized brick plant will make some 50,000 bricks a day, so that for a village of 100 houses it would take at best two months to product required number of bricks.

Another point to be considered is that about 75% of the houses in the cultivated areas cover about 50 sw. meters whereas present plans suggest that a dwelling should have a minimum of 100 sq. meters of area, which means doubling

the area of the village, and this would decrease the area of cultivation by the same amount. Road improvement, too, would take from the cultivated land area.

Attached are photostat plan and elevation of five proposed dwelling units to be erected at Embaba. These are to be constructed of mud brick and to be completed by June 30, 1953. An additional 15 houses are to be constructed in rural areas in groups of not less than five houses each. Sites for these probably will be chosen in the Delta area, especially in parts of this area having greatest precipitation, in order to test the practicability of the stabilized mud brick and its unpermeability to moisture.

6. Little, Arthur D., Inc. Preliminary report on Egyptian village housing, building materials, and methods of construction to [U.S.] Administrator, Technical Cooperation Administration. (Dept. of State contract no. SCC. 14032.) Cambridge, Mass., Arthur D. Little, Inc., Apr. 1952, reprinted August 1952. 126 p. processed, photos., map, plans, cross sections, tables.

Moderate rainfall: Alexandria and coastal section north of Tanta.

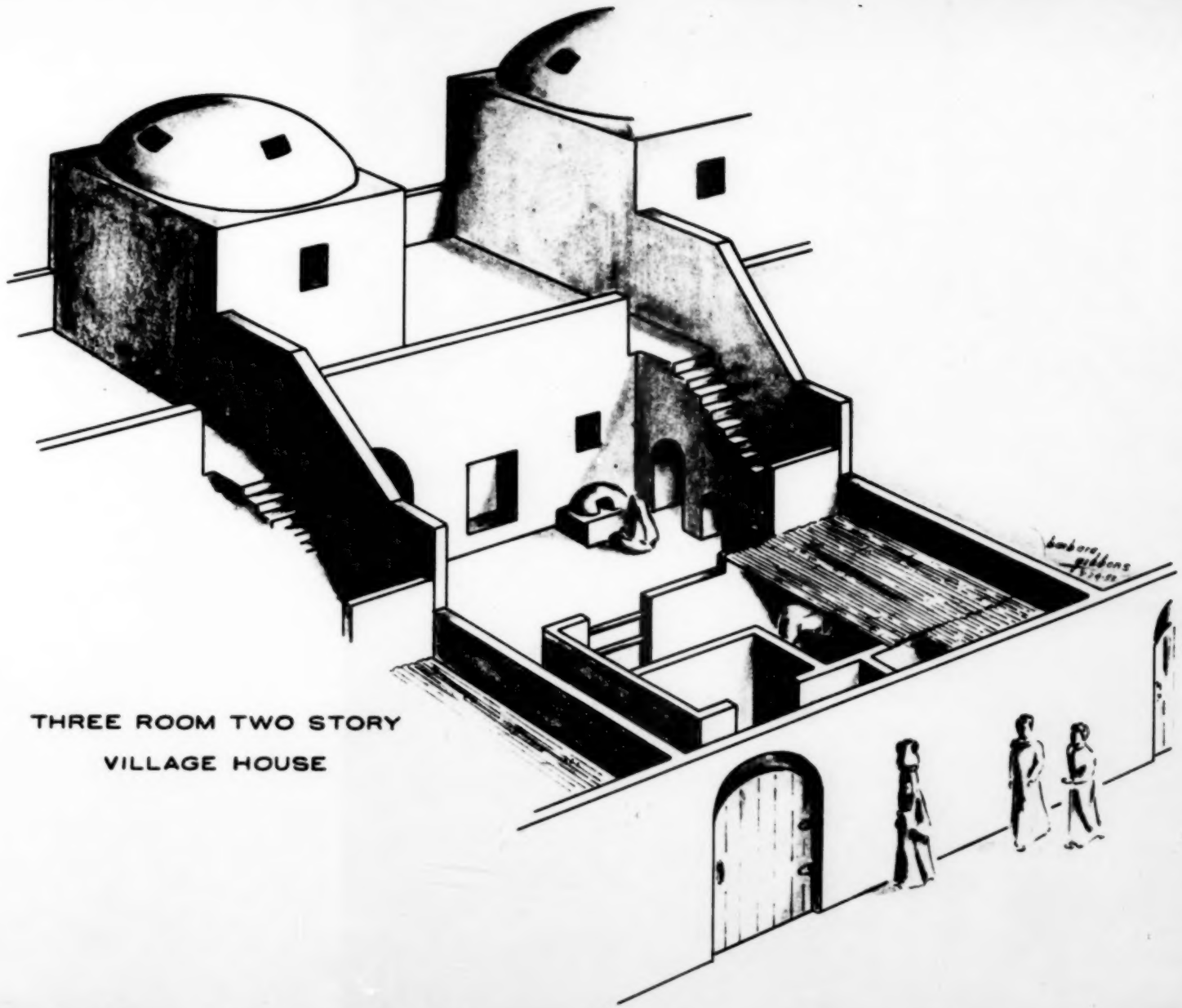
Low rainfall: Tanta to Cairo and Middle Egypt.

Dry climate: Upper Egypt.

Report was prepared for use of U.S. Technical Cooperation Administration and also for use by Ministry of Social Affairs and others in Government in Egypt. Figures are in Egyptian currency unless otherwise stated. The Egyptian pound is worth about $2.88 in U.S. currency, 1955. The piaster is 1/100 of a pound or slightly less than 3 cents in U.S. money. Land measure is in feddans, the Egyptian "acre," which is about 3% larger than the U.S. Acre.

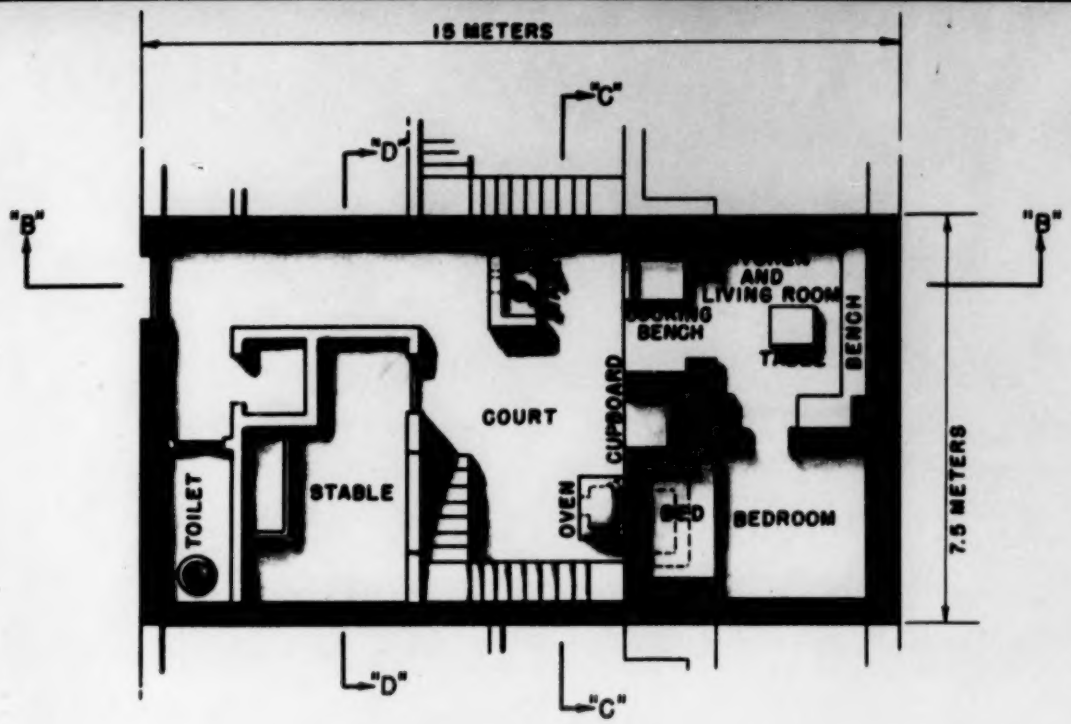
Red brick, lumber, steel and concrete are expensive in Egypt and their transportation in the interior of the agricultural areas is undependable. The most plentiful and universally available raw material is Nile Valley clay. This in the form of sun-dried brick makes good building material in the parts of Egypt that have no rain, and experiments have shown that a bitumen soil mix, using the Egyptian agricultural land mixed with a small percentage of a bituminous material has produced a moisture resistant sun-dried brick which can be used in all parts of the country except possibly the extremely wet coast line.

This water-resistant material makes it possible in any part of the country to use the dome roof construction which has been successful in Upper Egypt, and in this way eliminate the use of wood, steel and concrete. It has been found that local masons soon learn the simple technique of building this dome structure. It is possible to make the outside of the roof either domed or flat, and flat-roofed or two-storied construction is feasible. The

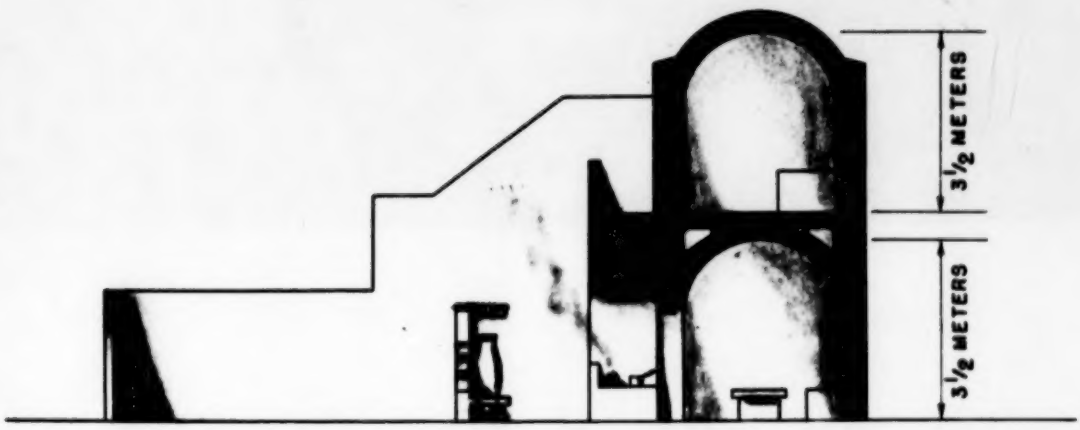


THREE ROOM TWO STORY
VILLAGE HOUSE

Arthur D. Little, Inc.



FIRST FLOOR PLAN



SECTION "B-B"

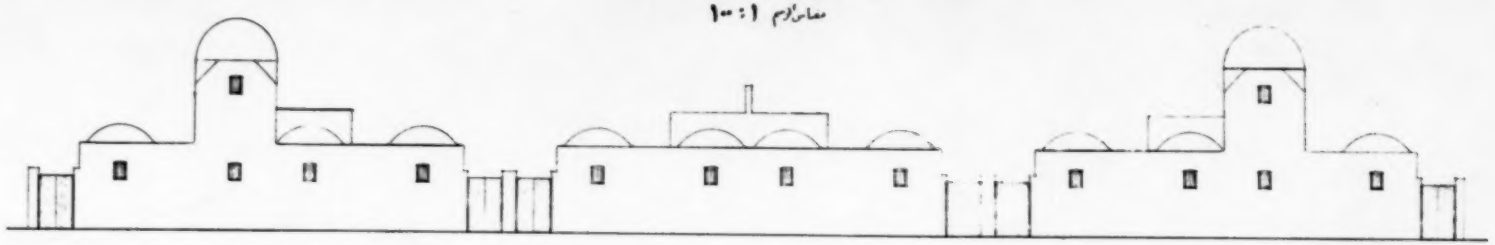
THREE ROOM HOUSE

SCALE

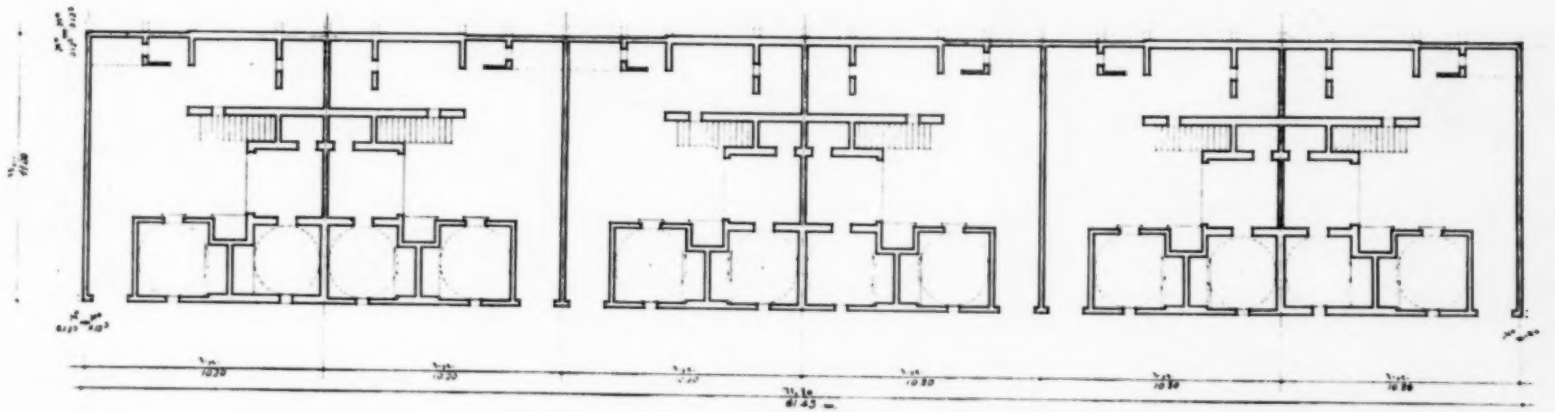
Arthur D. Little, Inc.

وحدة سكنية ريفية لستة مساكن

مقياس الرسم ١ : ١٠٠



الواجهة الرئيسية



مسقط أفقي

وزارة الشئون الاجتماعية
مصلحة المساكن الشعبية

مدير عام المساكن الشعبية

Arthur D. Little, Inc.

flat roof should be suitable for sleeping area in summer. Surfaces both inside and outside should be suitable for plastering and white-washing.

This report visualized the representative village house as a structure of either two or three rooms, of either one or two stories, with an inside courtyard, insuring privacy, and a stable for animals located outside of the house enclosure but near enough to insure safety and security. General layout must be of type favorable to row construction in order to take advantage of the saving by use of party walls and in order to use the land space economically. The house should have built-in features such as sleeping and work platforms, an oven, closets, provision for food storages, etc. Any new village group of houses should have conveniently placed deep well pumps to supply pure artesian water at the ratio of one pump for every 20 families. Toilet facilities using simple-low-cost septic tank principles should be provided for each dwelling.

This report estimates that a suitable two-story three-room house for the average, or better than average size family can be built for less than £ E (Egyptian pound) 200, and that a two-room single-story house should not cost over £ E 150. These figures presuppose an efficient construction and only moderate profits to contractor.

Among the places visited and described by the researchers is Embaba.

Embaba

This is a Government-planned development for city workers of 6000 family units with city water supply and sewerage, of which over 1100 have been built. The layout is rectilinear with wide streets and open spaces for schools, a social center group of buildings, playground and library. The houses are all two-story, some in continuous row, some as two-family separate units. Exteriors are either red brick or concrete or limestone ashlar masonry. The cost of each family apartment averaged about L.E. 200 per room, i.e., L.E. 400 for two rooms, L.E. 800 for a four room unit. Thus, a three room house costs L.E. 600 and rents for L.E. 16 per year, light and water not included. Three rooms mean a living room and two bedrooms. A bathroom and small kitchen are not counted as rooms. The kitchen has a sink and a small work space but no closets or shelves. The bath is small, with no tub but with a shower head which discharges directly on the floor. The floor is of concrete, sloping to a drain hole in one corner. The toilet is a hole in the floor connected to the sewer, served by a rinsing tap after the common fashion of the country. Floors and roof are reinforced concrete, the former covered with smooth concrete tile laid in about 8-inch

squares. Window space is ample; the windows are glazed and doors are of wood.

Embaba is an excellent example of city housing for moderate income workers who have individual incomes many times that of the village agricultural population.

Two development of the Misr textile companies at Mahalla el Koubra and Kafr el Dawar are excellent examples of housing for industrial workers where workers are given quarters at a modified rental. These are four sizes or styles totalling about 6000 which are said to range in cost from ₤ E 450 to ₤ E 650. There are living rooms, kitchens, bedrooms and bathroom facilities in units of four and five rooms. Houses are two-story brick or concrete construction built in row or block form. The layout is in form of self contained model village with central restaurant, markets, hospital and amusement centers.

In 1950 two model houses were built in outskirts of Cairo. One was of one-story, red brick foundation, sun-dried brick walls and roof of one-inch wooden plank on wooden beams. The area is about 130 sq. meters and the reported cost ₤ E 226. This does not include the labor which the prospective tenant contributed. The detail of cost follow:

Labor	₤E 25.2	
Red brick, including transportation	50.0	
Sun-dried brick (10,000)	13.5	
Mud and straw for plaster	8.0	
Doors, windows and hardware	25.2	121.9
Wood for roof		104.0
Total cost	₤E	225.9

Cost of wooden roof - 46% of total

The other house is small and was expected to cost about ₤ E 175, but owing to unexpectedly high fuel cost and low net usable production of the red brick manufactured on the job, the cost turned out to be much higher. Coal for burning the brick including transportation cost over ₤ E 1.5 per 1000 bricks. This experience proves desirability of using unburned brick for low-cost construction in villages remote from centers of transportation.

Materials. Since Alexandria and Cairo are growing at great rate new building there will require the greater share of available materials. Village housing then must not use conventional materials if costs are to be kept within reach of tenants. The comparative costs of building material is given in following table:

	L.E. Selling Price Or Material Cost	L.E. Equiv. Price Per Cubic Meter
Sun-Dried Brick	.70 Per 1000	.30
Oil-Stabilized Brick	1.20 Per 1000	.55
Red Brick	5.00 Per 1000	2.20
Sand Lime Brick	6.00 Per 1000	2.70
Ribal Brick		3.00
Limestone Masonry Laid*		2.50*
Ordinary Concrete		6.00
Reinforced Concrete		12.00
Foamed Concrete - Density 0.7		12.00
Terra Cotta Wall Tile (est.)		2.60
Cellular Stone (est.)		3.70
Plaster of Paris (est.)		6.75

* Where limestone is nearby and labor rates are low, rough limestone masonry is said to work out about equal in cost to red brick construction.

A report on rural housing in Puerto Rico is attached to the Report. It is by Luis Rivera-Santos, executive director of the Social Programs Administration of the Dept. of Agriculture and Commerce of Puerto Rico. He describes the Land Law of 1941, stating as a fundamental human right, the right of all tillers of the soil to ownership of at least a piece of that land for the erection of a home. In accord with this pronouncement the Social Programs Administration is entrusted with program, under which settlement is organized in which small parcels of land (1/4 acre to 3 acres) are allotted to landless farm workers. The land allotted is of a size to accommodate house, a few domestic animals and the growing of some food crops. The land is subdivided and ceded in usufruct. These planned settlements provide for future community services.

Some of the problems encountered are: training in needed skills; sources of construction materials; transportation; unity of action in group since work is hard and takes a long time; timing of work so that the family can earn a living at same time that the project is in progress; and most of all, the economic problem, since regardless of how low a cost of $300 for a concrete blocks and reinforced concrete house may be, it is a very large sum for any farm worker in a tropical area.

In the experimental project, rural families are organized in groups of from 12 to 15 families, and a few study and discussion meetings held to develop proper attitude toward hard work to come. First, a shed is built to house concrete block making machine ($250 cost) and where cement and other materials stored. No house is started until necessary concrete blocks are made. After sites of houses selected, the reinforced concrete foundations are built. A concrete mixer $590 cost) is used at this stage and when the reinforced concrete slab is being built.

The author discusses the financing of the first two experimental projects, one of 12 and the other of 15 dwellings as follows: the government through the Social Programs Administration, provides all technical assistance and a loan not to exceed $300.00 per house, for construction materials. To secure lower costs, all construction materials are bought by the Social Programs Administration. The settlers, organized in groups, provide all the labor required plus any materials that may be used out of their present dwelling. It is expected that salvage materials will be enough for the construction of the kitchen and for the doors and windows of the new house. The houses under construction consist of two bedrooms, 8' 3" by 8' 3"; one living-dining-bedroom 12' x 8' 3" plus a kitchen. All the house except the kitchen is made up of cement blocks with reinforced concrete floor, reinforced concrete roof, and reinforced concrete columns. A separate aluminum privy with concrete foundations is provided by the Department of Health.

It is expected that new designs, which will lower the cost of the house, will be developed. The present design is being used on the basis that a $300 direct capital investment is low enough for the type of dwellings being built.

At the present time, studies on the amount which should be required as down payment, if any, and general repayment for a large scale program are under way. On an experimental basis a down payment of $40 in two installments has been tried.

We are proceeding on the assumption that the $300 contribution made by the government will be paid in full, in 5 to 10 years without interest.

It is considered of great importance to plan for repayment on a relatively short time, as judged by urban standards. Families who have never made a long term loan and who

have a deeply rooted sense of insecurity cannot be expected to judge properly a 20-year plan to own a home. That is too much of a futurity for them to understand. Of course this does not mean that the repayment plan should be of such a nature as to work hardships on the family, especially on such items as food, clothing and health.

I. CURRENT LITERATURE

HOT HUMID AREAS

7. Ceylon. Ministry of Industries, Housing and Social Services. Dept. of Town and Country Planning. Rammed earth houses. [Colombo?] Government Press, 1954. 16p., photos., plans, sketches, cross sections.

Population: Colombo 362,074

Climate: 97/62° F

Rainfall: 80"

Rammed earth construction especially suited to building in Ceylon. This is much cheaper than brick, stone or cabook construction. It is also cooler.

Special timber moulds are used into which selected moistened earth is put and well rammed. This forms one section of wall, and is repeated until whole wall is formed. To protect wall from erosion the earth on the surfaces is hardened by the introduction of a little cement, lime or bitumen before earth is rammed in the mould (95% earth to 5% stabilizing material.) Designs for moulds is included elsewhere in the pamphlet.

The earth should be reasonably stable in its natural state, i.e. it should contain sufficient clay to bind sand and silt together but not enough to cause excessive shrinkage in drying, and it should be free from organic matter such as roots, grass, etc., since organic matter attracts termites. Earth consists broadly of sand and clay. Ratio of the two determines suitability of earth for walls. 65-70% of sand is considered ideal; 50-60% of sand is suitable and soil with less than 50% should be made up by addition of sandy materials, such as gravel or small stone.

The pamphlet is very well illustrated, showing methods of construction and typical house designs and floor plans. Attached are photostats of typical moulds for this rammed earth construction.

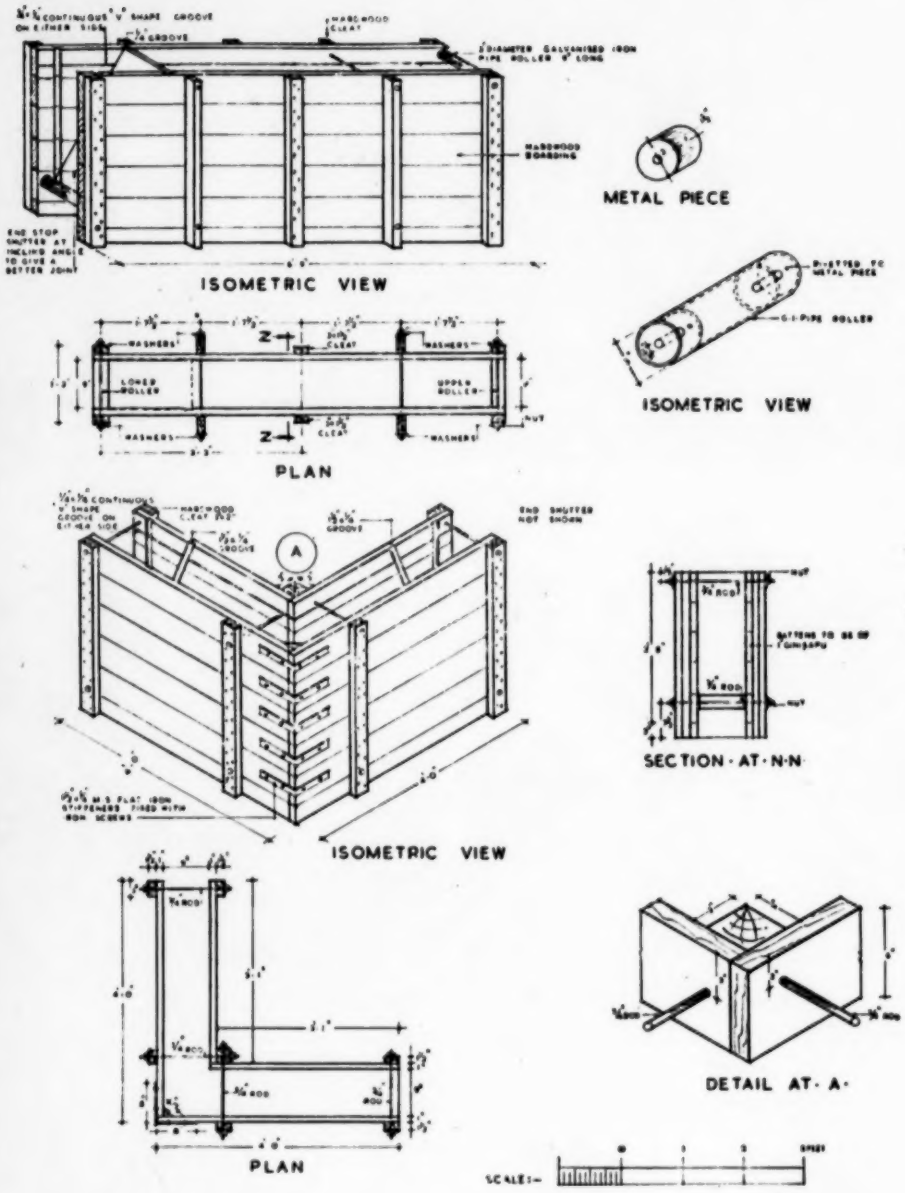
Inserted in report is a 2-page mimeographed appendix on "Soil Classification and Stabilization for Rammed Earth Construction," and "Colour Characteristics."

8. Grelier, Joseph. Notas geo-etnográficas sobre los indios piaroas. (A, hombre y expresión, Jan. 1954, 8 unnumbered pages, photos., sketches.)

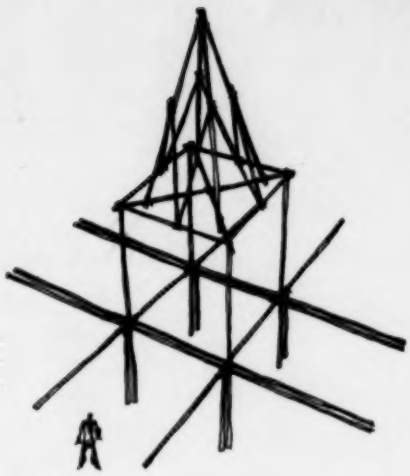
Climate: Very hot

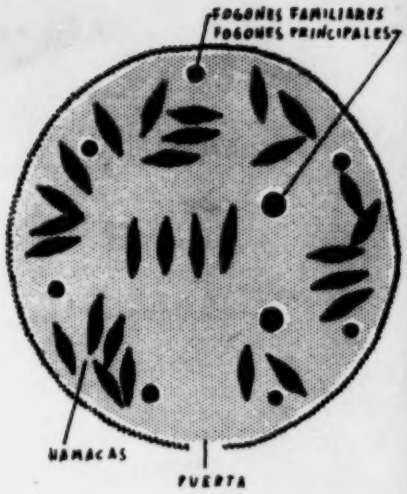
Rainfall: circa 280"

The housing here described is primitive housing of the Piaroas Indian tribe in Venezuela, and therefore I presume it is of limited interest to Mr. Doxiadis. There are, however, some very interesting photographs of thatched huts and a page of construction drawings of these huts, photostats of which are attached.

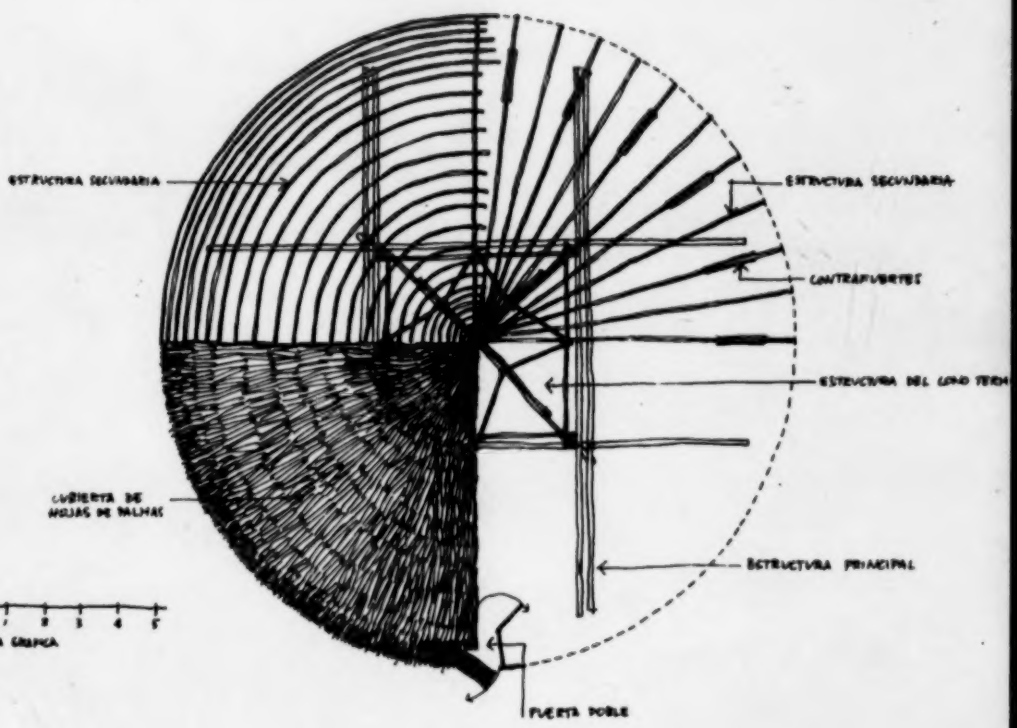


TYPICAL MOULDS FOR RAMMED EARTH CONSTRUCTION





la churuata



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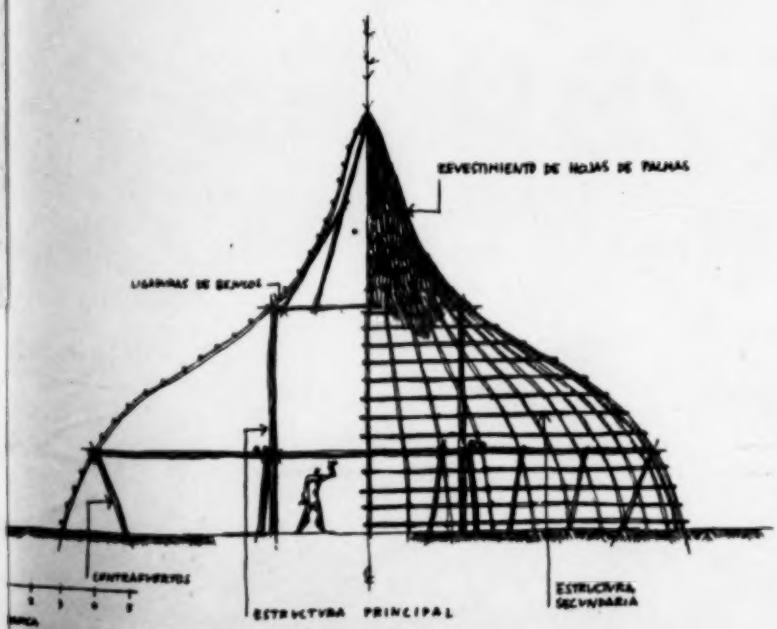


q al emplazar estas grandes conchas vegetales, los piaroas siguen siempre unos principios funcionales (vías de acceso, cercanía de la zona de producción y trabajo, aprovechamiento de las características naturales del terreno, salubridad de la zona, etc.) que constituyen un rudimental, pero orgánico urbanismo de la selva.

r esquema del armazón primario, cuya función es dar firme apoyo a la envoltura externa.

s planta de la churuata con la distribución interna de los grupos familiares y los fogones.

t planta.

u corte longitudinal.

9. Kendall, Henry. Town planning in Uganda: a brief description of the efforts made by Government to control development of urban areas from 1915 to 1955. London, Published by the Crown Agents for Oversea Governments and Administrations, on behalf of the Government of Uganda; also obtainable from the Government Printer, Entebbe, Uganda, 1955. 91p., photos., maps, plans, sketches, charts.

Population: Jinja: 30,000

Climate: 92/51° F

Rainfall: 60"

Mr. Kendall is Director of Town Planning, Uganda. His book is a record of town planning in the urban areas of Uganda, especially that of the last five years, and especially is it a record of planning in Kampala and Jinja. The plans of towns other than these two are still in draft stage.

The book is a beautiful example of the book-making art, and is well illustrated, but it is not concerned with housing as such, but with general all-over planning of the towns.

Perhaps the most interesting section from the housing point of view is that covering the planning scheme for Jinja, in Eastern Province, where the author discusses the racial problem. The following is a quotation:

RESIDENTIAL AREAS

In a multi-racial township such as Jinja there is a natural tendency for the various race groups to segregate and establish themselves in separate neighbourhoods; each community then proceeds to develop places of worship, learning and recreation. This absence of community structure within a town makes impossible the orthodox planning approach based upon the contemporary conception of the neighbourhood unit. A proposal has therefore been devised based upon multi-racial population groups of approximately 10,000 persons accommodated at various gross densities consistent with the race structure and degrees of social development of the occupants. These groups have been expressed on the [not shown] plan as population groups and are five in number. They will be developed at gross densities varying from fifty persons to eleven persons per acre.

In addition to these multi-racial population groups, it will be necessary to set aside certain areas for the development of purely African neighbourhood units having a full scale of social services and indirectly linked to the industrial zones. These neighbourhood units will be developed at densities varying from thirty-eight persons to eight persons per acre. They will be different in character, some being developed by Government directly and others by industrialists who are anxious to see their African labour properly housed and within easy reach of their work. Yet another unit will be built by Africans themselves under a self-help scheme.

Many problems have to be faced in order to create a settled urban African population, since the general tendency in Jinja and elsewhere is to regard the town as a place to work in and to obtain wages, at the same time maintaining a foothold in the country where the African has his roots.

By contrast the Asian regards Jinja as a permanent home and is willing to invest capital and to lease land in the town. He identifies himself very closely with his community and to a more limited extent with the town as a whole.

DESTINY AND OPTIMUM POPULATION

The present population of Jinja consists of some 30,000 persons of whom approximately 21,000 are Africans, 7,500 Asians, and 1,500 Europeans. With the correct implementation of the planning scheme the population can be more than doubled without extending the planning area. The optimum population has therefore been calculated at the figure of 80,000 and disposed in the five population groups and three neighbourhood units already described, based on the assumption that the relative percentages between the three races will remain fairly constant. Each of these groups or units when broken down to residential areas will be designed to accommodate a net residential density which will vary from place to place. The net residential density will be expressed in terms of habitable rooms per acre, and will be linked to the gross density by means of occupancy rate per room. The gross density shown on the plan of the scheme is expressed in persons per acre and the density taken over the whole neighbourhood unit, including such items as schools, playing fields, open spaces, community buildings, clinics, local shopping centres, etc.

Special sites to be set aside for multi-storey flat development and individual plot sizes will be designed to take account of the net residential density consistent with the overall gross density.

South African Council for Scientific and Industrial Research. National Building Research Institute. Research studies on the costs of urban Bantu housing. Pretoria, The Council, Dec. 1954. 285p. (2 separately numbered papers dealing with Bantu housing reprinted from National Research Institute bulletins.) plans, cross sections, charts, tables.

The following is an addendum to the digest of Dec. 31, 1955, no. 3, p. 4, and shows plan and costs of one type of Bantu housing.

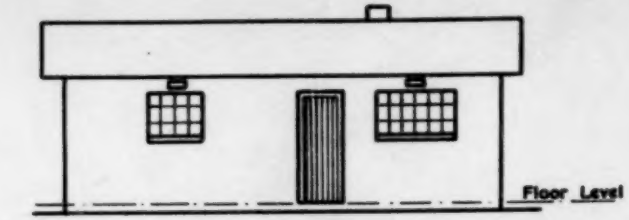
Table I.

Analysis of the cost of the technical elements in the NE51/9 type urban Bantu house: full conventional construction at Vereeniging: 30th June 1953

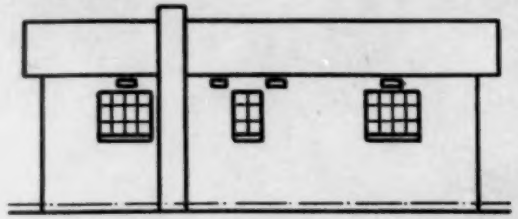
European Artisans

Op. No.	Technical element	European Skilled hours	European Semi-skilled hours	Un-skilled hours	European labour cost	Native labour cost	Material cost	Total Prime Cost	European labour as per cent total European labour	Native labour as per cent total Native labour	Labour as per cent prime cost	Material as per cent material cost	Material as per cent prime cost	Per Cent prime cost.
					£	£	£	£						
1	Foundations and floors (including foundation walling, earth-filling, etc.)	15 10	9 600	102 9	7 18 9	6 10 0	16 13 6	31 2 3	12 162	19 729	5 586	10 404	6 449	12 035
2	Superstructure including damp-proof course	123 20	--	253.8	45 3 2	17 9 0	64 5 11	126 18 1	69 191	52 966	24 222	40 118	24 875	49 097
3	Doors and windows including setting up, hanging and ironmongery	17 90	--	30 6	6 11 3	2 2 1	28 3 2	36 16 6	10 055	6 387	3 353	17 570	10 894	14 247
4	Roofwork	9 50	--	22 5	3 9 8	1 10 11	37 15 9	42 16 4	5 337	4 692	1 946	23 578	14 619	16 565
5	Glazing and limewash	2 70	--	21 5	0 19 10	1 9 6	4 8 0	6 17 4	1 519	4 477	0 954	2 745	1 702	2 656
6	Fittings and stove	3 10	--	4 3	1 2 8	0 5 11	8 19 0	10 7 4	1 736	0 898	0 553	5 585	3 464	4 017
7	Sundry Native labour	--	--	52 0	--	3 11 6	--	3 11 6	--	10 851	1 383	--	--	1 383
	Total	171 50	9 600	487 6	65 5 4	32 18 11	160 5 4	258 9 7	100 000	100 000	37 997	100 000	62 003	100 000
						98 4 3								

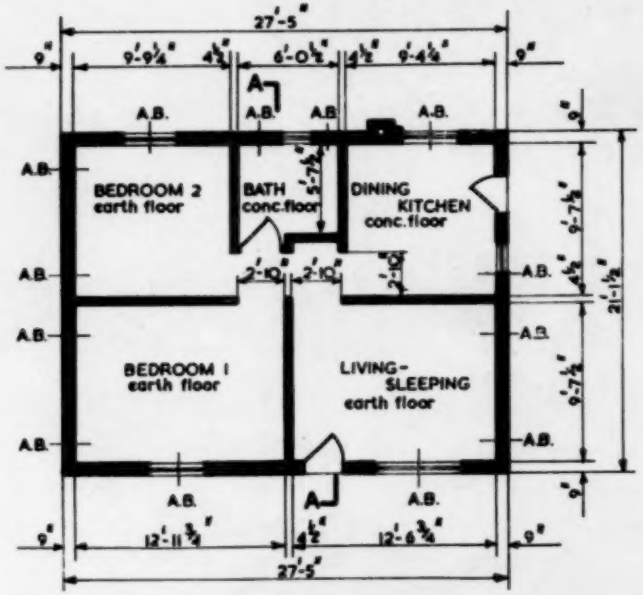
Overheads 10.79 per cent of £258 9s. 7d. = £27 17 10
Total cost = £286 7 5



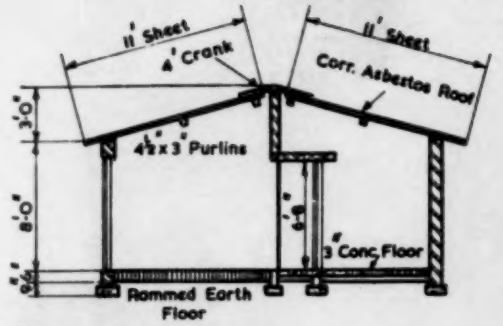
FRONT ELEVATION



BACK ELEVATION



PLAN



SECTION A.A.

Fig. 1.—*The NE 51/9 type house as used in the studies on norm costs.*

Van Fleet, Gen. James. Homes for Korea. (In Banking, journal of the American Bankers Association, Aug. 1955, vol. 48:2, p. 78, 80; with sketch.)

General Van Fleet was commander of UN forces in Korea from 1951 to 1953. "Homes for Korea: is this year's project of American Korean Foundation, which was established in 1952. It is a nonprofit, nonpolitical, nonsectarian organization which has assisted Korea in various fields of health and welfare, and has been supported largely by contributions of GI (American soldiers).

More than 600,000 homes needed. In addition there are about 4,000,000 refugees from North Korea who are presently homeless in South Korea. In spite of all the agencies working there housing has not been touched so far. These agencies concerned more with long-range regional plans.

General Van Fleet is honorary chairman of this Housing Project, and William Zeckendorf, Sr., president of Webb and Knapp, and Earl Smith, president of the National Association of Home Builders, are co-chairmen.

The Foundation has allotted $150,000 to this project for the express purpose of constructing a pilot project of 100 houses in Seoul, an urban area. Its aim is to supply the Koreans with these 100 houses but also it is to serve as a means of teaching the Koreans some basic principles of low-cost, mass-produced housing construction.

Basic to design of Korean housing is the ondal heating system which was devised by Koreans and developed to high degree of efficiency. The cooking fire, built at one end of the house, also serves as heating unit for the house. The heat is conducted underneath floors of the house through ducts which are formed by the flat stone floor slabs placed on vertical stone supports. In this way floors are kept warm and smoke goes out through a flue at the cooking area end of house. The system can be improved upon and constructed more easily by using materials and methods developed in mass production.

The American Korean Foundation will build these first 100 houses but with the help of American business. The houses can be built for $1500 each, though the first units will cost more because of initial transportation of material and personnel, etc. Campaign now (Aug. 1955) under way to solicit funds and a construction staff is to leave shortly.

Population: Seoul, 1,141,766

Climate: circa 100/10° F

Rainfall: circa 47"

III SPECIAL ARTICLES

Houses for Africans in Southern Rhodesia, from a correspondent. (In the Economist, Aug. 13, 1955, p. 554-555.)

Complete text follows: Houses for Africans

Partnership is the professed political faith of the Federation of the Rhodesias and Nyasaland, but doubts are expressed both by intellectuals in Britain and by Africans in the Federation; partnership, they say, is apartheid writ small. Where, they ask, is evidence of a real intention to advance the African to genuine citizenship? Of the three territories, Southern Rhodesia is the most suspect, yet Southern Rhodesia's present housing scheme does offer just such evidence. This colony has recognized sooner than some of its neighbours that with a steady increase in population, the African must either have more land or become urban and industrialized a dilemma that can be postponed but not avoided by the better use of existing land. Rural policy in

(Continued on photostated page herewith)

Southern Rhodesia has aimed at building up the "master farmer," a peasant with from ten to thirty acres of arable in a consolidated holding which he farms well and can leave to his son, together with the grazing rights that go with it. This holding may not be split; the younger brother must therefore go to town.

The urban counterpart of the master farmer is the industrial worker who lives with his wife and family permanently in or near the town. In South Africa the policy is to discourage permanent settlement and rely on "migrant labour"—men who go home after a year or eighteen months to make their wives pregnant and forget their industrial skill. In Southern Rhodesia, the employer must pay the employee's rent, which is fixed at £1 a head whether for single or married accommodation. The intention was to put a premium on the married permanent worker, who is more reliable than the migrant and costs his employer no more. But it has not worked out like that; faced with a chronic housing shortage, the municipalities have tended to build single quarters first, housing five men in a room and using the rent of £5, of which at least half is profit, to finance married accommodation, on which they lose money. In the eight years up to 1953, the municipalities built 12,401 married and 55,517 single units, financed by loans from the government. The shortfall then was 18,670 single, and 7,168 married. A year later, the single shortfall was slightly reduced but married had risen to 9,855.

The scheme that is now getting under way is designed not only to build houses but also to tackle social evils. The African must at present be housed by his employer and is often fed; his wages—the employer sometimes says—are pocket money. But few people learn to handle money wisely until they own property and face the responsibility of housing and feeding their families. So the new scheme is to pay for itself, and the occupant is to pay for and eventually to own his house. A four-roomed cottage costs about £300, which at 5 per cent is paid off in twenty years by £2 a month, to which must be added £1 a month for metered water, street lighting, roads, sewerage, administration. But about £1 a month is generally taken to be the most that the unskilled worker can find at present wage levels. How then is he to pay £3 and make a £300 cottage his own?

Encouraging Initiative

He will have to live in two rooms to begin with and let two to lodgers, who will each pay him £1 a month. (Kitchen, lavatory, shower, will be a separate block outside the main building.) When the married man can afford another room, he gives one lodger notice. Meanwhile, 6,000 married couples find homes and 12,000 single men each gets a room to himself which he hires from a friend. Of 6,000 houses, 400 will be "self-help" houses; the government builds two rooms, the buyer moves into them and builds on what he likes with his own labour or by a contractor. He may also build on to a four-roomed house; he may, when he can afford it, connect to the electric or water mains.

Many objections are voiced. The rooms are too small; water and electricity are not laid on inside the building; two rooms are not enough for a family. True, but anyone who can afford more than £1 a month can turn out his lodgers, build on, connect up; the scheme is elastic, it encourages initiative. The married man who pays £1 a month will, it is true, find himself in two rooms instead of the four he may now be lucky enough to get. But in twenty years the house will be his. The tenure is a 99-year lease, but it can hardly be doubted that the leases will be changed to freehold in less than 99 years. This is, it is true, a lower middle-class scheme; it provides for the clerk or lorry driver who is making good, not for the few but immensely influential professional men.

African criticism is directed at all these points; this is to be expected. So long as eleven out of twelve of the population feel themselves outside political power their criticism will seldom recognise that coats must be cut to fit cloth. But it is a professed object of the scheme, by creating urban African property holders, to lead for the first time to "a system of responsible local government for the African in the urban areas." Together with schools and clinics, the scheme will cost £2 million. The Colonial Development Corporation is finding £1 million repayable in thirty years; half a million is coming from two insurance firms on a twenty-year basis and half from ten years' credit from contractors. But the shortfall is not mopped up; an extension of the scheme, modified in the light of experience, will be needed next year. Nothing can contribute more directly to prosperity and contentment in the Federation than good housing and this scheme embodies principles which — though they do not look startling from Europe—in Central Africa are revolutionary.

Notes from Australia

(These Notes are Contributed by Our Correspondent in Canberra)

The Labour Party's Faction Fight

FEVERISH preparations are being made for the special conference in Sydney this weekend to elect a new State Labour party executive. The purpose of the elections is to break the control of the New South Wales Labour machine, now in the hands of supporters of the industrial groups, from which the Labour party has officially withdrawn recognition. The groups, originally organised to fight Communist tactics within the unions, have become inextricably involved in the Labour party's struggle for power. The special conference this weekend represents the victory of the Labour traditionalists and left-wingers over the right-wing, predominantly Catholic faction that rose to power through the industrial groups' successes.

The victors are now divided among themselves on the extent to which their triumph should be pushed. The real leftwingers and the power-hungry, and those with scores to pay off, are all for wiping out the right-wingers completely, and are prepared to split the party in New South Wales, as they did in Victoria. The more moderate opponents of the right-wingers merely want to break their hold on the party. A complete split in the Labour movement in New South Wales would almost certainly mean the end of the Cahill Labour government, which goes to the electors early next year; and since New South Wales is the key state in federal politics, it would also seal Labour's fate at the next federal elections.

Leading members of the party's federal executive—the